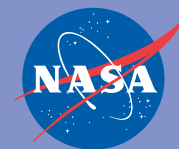


National Aeronautics and Space Administration



Roundup

LYNDON B. JOHNSON SPACE CENTER

Spring | 2014



Starring in our own destiny

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NASA/PHOTO

On the cover:

This image of documenting an Expedition 31 star trail composite was featured in the NASA: *Through Our Eyes* exhibit (more on page 9). Docked Soyuz and Progress spacecraft are also visible.

MOST OF YOU BY NOW have heard us talk about Johnson Space Center 2.0 and the need to find new ways to advance human spaceflight. Making sure we are effectively tapping into all available talent is key to our success in that endeavor. Over the past several years, we've been stressing the link between inclusion and innovation. We've learned that bringing together people with diverse backgrounds, experiences and perspectives to work on our complex problems inevitably results in better solutions. Being inclusive means much more than just treating people with equality, regardless of their age, gender, ethnicity, sexual preference or spiritual beliefs. At its core, being inclusive is about helping others succeed so that the team can succeed. Part of being inclusive is about making sure management approaches we use don't cause us to overlook potential leaders.

In the spirit of JSC 2.0, at the start of this year, we began a new pilot program called the Transparent Opportunities Pilot (TOP). Designed to enhance employee engagement, increase transparency and employee awareness of career development opportunities and strengthen our "bench," TOP aims to help supervisors and employees alike discover hidden talents and leadership opportunities within participating organizations.

Some organizations, such as Procurement, Legal, Office of the Chief Financial Officer and Safety and Mission Assurance, are "all in" on the pilot program, while larger organizations, such as Engineering and Human Health and Performance, have major divisions participating. All told, some 675 civil service employees, or about 23 percent of the JSC civil service population, will participate in TOP this year. Each of these organizations will define and track "opportunities" and customize TOP for their own use, but they'll all discuss best practices and participate in analyzing our level of success as a center when we look at whether the concept can be applied throughout JSC.

So why is this necessary? We've all seen the situation—a challenging task crops up. Maybe it's a tiger team or a rotation or a chance to work on a center or agency team, or make a high-profile presentation to a center or program board. These opportunities can provide great experience and get you noticed. Who gets these assignments? In the past, supervisors would frequently turn to someone who had successfully demonstrated taking on challenging assignments. That seems reasonable and is a natural tendency—supervisors have a lot on their plates, and it is often said that the first-line supervisors have the hardest job in the agency. It is easy to understand why a leader would turn to team members who have typically been strong performers. But in just assigning the task without asking who is interested, they may have overlooked others who were equally skilled or had the potential to be successful because they brought a new perspective. Someone else in the organization may be just as talented or just as hungry to grow and learn, but they may not have been chosen in the past for a variety of reasons. (Maybe they were waiting to be asked, or maybe they assumed the supervisor had a few favorite go-to people and wouldn't welcome a volunteer.) I know from experience that, most of the time, the supervisor is just trying to get the work done and wants someone to get started on it.

TOP is a commitment by participating managers to actively solicit volunteers for these "stretch assignments" so that anyone willing may embrace a challenging task that allows the employee to develop new skills or demonstrate previously hidden talents. This allows supervisors to be more inclusive in helping team members develop their own skills and talents, makes employees more valuable to the team and the team itself stronger, more capable and more valuable to NASA.

Part of the TOP strategy is to share the experiences of participating organizations with the rest of the center so that everyone can benefit. So, keep your eyes and ears open. When someone asks you if you're up for a new challenge, try not to think about the extra work it might entail . . . but about the potential benefits to you, your career and your center when you succeed. It is going to take all of us working at full speed to advance human spaceflight. If you are looking to advance human spaceflight and your career, look for TOP opportunities and raise your hand!



NASA/PHOTO

Melanie Saunders

Associate Director (Management)

Space station extension to 2024 expands economic and research horizons

WITH THE RECENT announcement from NASA Administrator Charles Bolden that the Obama administration supports the extension of the International Space Station to at least 2024, the orbiting laboratory will provide a microgravity research platform for an additional decade. This extension will continue current investigation into human space exploration, allow for a myriad of scientific discoveries and promote economic development.



NASA/PHOTO

A set of NanoRacks CubeSats is photographed by an Expedition 38 crew member after deployment by the NanoRacks Launcher attached to the end of the Japanese robotic arm. The CubeSats program contains a variety of experiments such as Earth observations and advanced electronics testing.

“The [space station] is a unique facility that offers enormous scientific and societal benefits,” Bolden wrote. “The Obama administration’s decision to extend its life until at least 2024 will allow us to maximize its potential, deliver critical benefits to our nation and the world and maintain American leadership in space.”

This decision provides traction for space exploration by prolonging the testing timeframe for essential technologies related to long-duration journeys—such as to an asteroid or Mars. Optimizing systems like the Environmental Control and Life Support System aboard station refines designs for future spacecraft.

“I really see the space station as the first step in exploration,” said NASA Associate Administrator William Gerstenmaier. “It is gaining us operational experience in a distant location, well beyond the Earth.”

With a full decade ahead, researchers have the extended timeline necessary to plan for scientific exploration in microgravity as well. With readily available space station facilities, an additional 10 years of research opportunity will allow for greater chance of follow-up investigations. Allowing the time for multiple cycles of study within a particular discipline not only enables scientific results, but also adds to collective scientific knowledge.

In the next 10 years a wide variety of investigations will begin, continue and complete experimentation in orbit. From developments in astrophysics from the Alpha Magnetic Spectrometer and the Monitor of All-sky X-ray Image, we learn more about our universe. Earth remote-sensing

instruments help researchers study our planet and assist with disaster recovery efforts.

Anticipated developments from the upcoming one-year mission and biology studies, such as T-Cell Act In Aging, may aid future explorers and people with related health concerns on Earth. Industries also benefit, with applications from fundamental physics investigations, such as microgravity fluid physics and combustion tests.

“Humankind has never had laboratory capabilities like these—where gravity can be controlled as a variable,” said International Space Station Chief Scientist Julie Robinson, Ph.D. “The extension of the space station to at least 2024 gives scientists what we need: time to build the experiments and theories that could come from nowhere else.”

With regular visits by commercial cargo vehicles to the space station, low-Earth orbit may transition from exclusive to accessible. Business opportunities and growth for companies that provide cargo to the space station helps them to expand and compete. This can drive down costs per visit, and eventually those costs will improve access to orbit without a NASA-maintained laboratory. As international interests expand, global economies develop, creating the potential for new jobs, technologies and the possible creation of untapped markets.

“Commercial use of the space station is growing for research and development each year. Other government agencies, such as [the National Science Foundation] and [National Institutes of Health] also are funding scientists to use the laboratory,” Robinson said. “Space agency funding is enabling a much larger set of innovative research ideas from the private sector that will transform the way we see orbit.”

Recognizing the continued potential and growing benefits of the orbiting outpost, NASA and our international partners are discussing the possibility for space station life beyond 2024.

“[The partners] want to go forward with this,” Gerstenmaier said. “It’s just working through the government approval, through their individual groups to get to where they need to be.”

Ultimately, the space station provides the capability for important microgravity research, understanding a changing planet from a global perspective and comprehending survival in the harsh environment of space.

“If we as a species are going to get off the Earth . . . we are going to have to use this small foothold called the International Space Station to go do that,” Gerstenmaier said.

The International Space Station, seen here from the vantage point of the crew of the 2010 STS-130 space shuttle mission, completed more than 1,500 investigations during its first 15 years in orbit.



NASA/PHOTO

Mission Operations prepares to take the helm of the Orion spacecraft



By Brandi Dean



Members of the flight control team that will see Orion through its first flight participate in a dry run to prepare for their role in the mission.

Program. “A lot of the training we’ve been doing with the flight control team has helped us ring out the system. It’s just been fantastic for us—having this test flight in this timeframe has been wonderful.”

Overall, Spivey said, the process has gone smoothly. The testing has revealed flight software problems that the team was able to work through and repair with plenty of time to spare. They’ve done simulations, tested out the new tools and communication loops in the redesigned control room and verified that Orion-formatted data will be able to make it down to the ground. The preparations aren’t complete, yet, but Spivey and Sarafin agree that the team will be ready when it’s time to launch.

“When we show up on a mission day, we take for granted that our tools are going to work,” Sarafin said. “But there’s a lot of work that goes into that, and we’re in that phase now.”

Meanwhile, Spivey said, the team is enjoying the experience.

“I can’t tell you how many times team members have commented on what a big morale boost it is to get back in the flight control room and see spacecraft data,” Spivey said. “It’s been great to watch their reactions and dedication to getting us ready to fly Orion.”

IN JUST A MATTER OF MONTHS, NASA will send a new spacecraft into space for the first time. And back here in Houston, the Mission Control Center (MCC) will be at the helm.

“It’s the first flight of a brand new program,” said Mike Sarafin, lead flight director for Orion’s Exploration Flight Test-1. “There’s been a lot of testing done on the ground, but we’re going to really, no kidding, prove that this thing can fly.”

It’s a milestone for which Sarafin’s flight control team of about two dozen people has been preparing for two years. With no crew aboard Orion for the first two missions, the flight controllers will serve as the eyes and ears to monitor the health and status of the spacecraft. If something goes wrong, it will be up to them to fix it. That’s not exactly a new concept for the team members, all of whom have experience at space shuttle flight control consoles under their belt. Skills such as understanding a failure, its impact and its workaround are talents that are bred into flight controllers at Johnson Space Center.

But this won’t be quite like any mission they’ve flown before.

“Math is still math, engineering is still engineering, physics is still physics,” Sarafin said. “But the spacecraft subsystems, the design, the capability is all different. So we had to start from scratch and build our own displays and products and procedures.”

They did that with the help of the MCC engineering team, which just happened to be planning a major upgrade of all three of the main flight control rooms. Mission Operations had already decided that it would be necessary to modernize the facility in such a way that maintenance and operations costs would go down by half when the agency decided that Exploration Flight Test-1 would take place in 2014. The timing worked out perfectly for the two projects to develop side by side.

“Exploration Flight Test-1 will be the first time we’ve used this new equipment and platform,” said Jimmy Spivey, manager of the Mission Operations Exploration Office, and of Mission Operations for the Orion



(From left) Josh Keely, the prelaunch EECOM—or electrical, environmental, consumables engineer—officer, works side by side with Kristen Wollard, lead EECOM for Orion’s first flight, at their console in the upgraded “Blue” Flight Control Room.

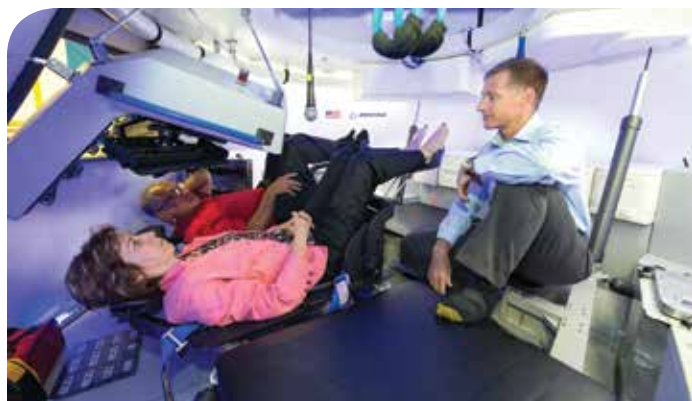
Commercial Crew begins 2014

by meeting milestones



By Megan Sumner

IF EVERY JOURNEY BEGINS with a single step, then NASA's Commercial Crew Program (CCP) will provide critical footwork as America pushes its boundaries for human exploration deep into space. With CCP and the U.S. aerospace industry covering the area between Earth and the International Space Station, NASA can turn more of its research capabilities and resources toward solving the most daunting puzzle of deep-space travel for humans.



Chris Ferguson, a former space shuttle commander who is now director of Crew and Mission Operations for Boeing Space Exploration, explains as NASA administrator Charles Bolden and Johnson Space Center Director Ellen Ochoa sit at the controls in the company's CST-100 spacecraft simulator.

This will be accomplished like never before with private companies putting in the time, energy and innovations necessary to design and manufacture space systems that could ultimately make space travel less expensive and more accessible for everyone. NASA intends to use new commercial systems to fly U.S. astronauts to and from the International Space Station.

All four of NASA's current industry partners are proceeding in the development of their unique designs for spacecraft that could carry crews to low-Earth orbit. They began 2014 by meeting several milestones and planning for several more. The partners are Blue Origin of Kent, Wash.; Boeing Space Exploration of Houston; Sierra Nevada Corporation (SNC) Space Systems of Louisville, Colo.; and Space Exploration Technologies (SpaceX) of Hawthorne, Calif.

Blue Origin prepared to complete its two remaining milestones under an unfunded Commercial Crew Development Round 2 agreement extension in 2014. The company will review the design, manufacture and assembly of its sub-scale propulsion tank, a smaller version of the fuel tank that will boost the company's space vehicle in low-Earth orbit. Next will be an interim design review of the vehicle's subsystems. The company also test-fired its BE-3 engine in late 2013.

Boeing worked with United Launch Alliance to complete milestones in the development of an emergency detection system and launch vehicle adapter for the Atlas V rocket planned to launch Boeing's CST-100. The company also demonstrated that pilots could take control of the CST-100 and fly it through various phases of a mission successfully as part of its Commercial Crew Integrated Capability agreement.

Chris Ferguson, director of Boeing's Crew and Mission Operations and former space shuttle commander, led the testing. Sitting inside a simulator replica of the spacecraft, Ferguson demonstrated how the CST-100's flight computers would immediately relinquish control of the spacecraft to the pilot—a NASA requirement for crewed spacecraft destined for low-Earth orbit. The feature is comparable to turning off the autopilot function of a commercial aircraft.

The crew and service module designs of Boeing's CST-100 will go through a critical review that will help the company determine if the spacecraft, as a whole, is ready for manufacturing.

NASA worked with a team of engineers and designers from SNC in 2013 to review detailed certification and systems safety plans for its Dream Chaser Space System.

In 2014, SNC is continuing to build on that progress with wind tunnel tests and further advancement of its innovative main propulsion and reaction control systems, and a second free-flight test of the Dream Chaser.

SpaceX performed successful parachute drop tests in late December of 2013. Engineers and safety specialists gathered in Morro Bay, Calif., to watch as SpaceX demonstrated how the Dragon spacecraft's parachute system would function in the event of an emergency on the launch pad or during ascent.

The 12,000-pound Dragon was lifted 8,000 feet above sea level by an Erickson Sky Crane helicopter and flown over the Pacific Ocean. Following Dragon's release, two drogue parachutes were deployed from the top of the spacecraft to slow its decent before the three main parachutes followed. The vehicle splashed down and was quickly recovered by the Sky Crane and carried back to shore.

During a normal spacecraft landing, the parachutes will be aided by Dragon's SuperDraco thrusters to provide a soft controlled landing.

(continued on page 8)



Blue Origin test fires a powerful new hydrogen- and oxygen-fueled American rocket engine at the company's west Texas facility. During the test, the BE-3 engine fired at full power for more than two minutes to simulate a launch, then paused for about four minutes, mimicking a coast through space before it re-ignited for a brief final burn.

NASA/JAMES BLAIR JSC2013E076049

NASA/PHOTO KSC-2013-4198

The pressures of **confinement** bring NASA one step closer to an **asteroid mission**



By Megan Sumner

THE NASA FLIGHT ANALOGS PROJECT (FAP) conducts research in ground-based facilities that provide simulation scenarios and environments similar to those encountered during exploration missions. The FAP supports Human Research Program (HRP) objectives, which use ground

All that my crew mates and I will have are each other, communication with the 'ground control' in either real-time or on 10-minute communication delay (each way), space food, water, clothes, music and movies/shows we bring and, (thank goodness) a real bathroom.

In addition to the flight operations, investigators will study our personal behaviors during the day, as well as how we act as a team, our cognitive skills at the end of a long work day and how we manage unexpected surprises in our schedule, (whether they are) urgent or non-urgent."

The volunteers were confined in the habitat for 24 hours a day for seven days. The project managers made it their objective to make the crew feel as if they were truly on a mission to an asteroid and forget that they were actually in a building on-site at JSC.

During the excursion, the crew practiced and took tests on a simulator that flies around an asteroid. The program mimics a real asteroid, named Itokawa, with lights,

cameras, robotic systems and a control system. Facial recognition was used to track the crew members and detect signs of distress, fear, joy and more as they flew the simulator. The results were compared to previously collected baseline measurements, including example expressions, so interventions were possible.

The primary focus of the simulator was learning how to fly. The program used was extremely realistic for the crew and included a scatter of synthetic rocks for depth perception. The team could go from site to site to do different inspections, fly around and navigate the asteroid.



The HERA is a three-story habitat complete with a medical work station, gym area, crew sleeping quarters, bathroom and garbage shoot.

analogs of the space exploration environment aimed at the conservation of spaceflight resources while addressing research questions that are bringing NASA one step closer to a future manned exploration mission.

The Human Exploration Research Analog (HERA) is a three-story, four-port habitat unit residing in Building 220 at Johnson Space Center. The HERA represents an analog for simulation of isolation, confinement and remote conditions of mission-exploration scenarios. It is cylindrical, with a vertical axis, and connects to a simulated airlock and hygiene module.

The habitat has been to the desert twice as part of the Desert Research and Technology Studies, where the program uses the arid climate, harsh winds and rocky desert terrain to evaluate different conditions while developing and testing spaceflight equipment and technology.

After being turned over from the Engineering team to the HRP after some modifications in 2013, one year later the habitat was ready for HERA. The first experiment, which took place in March, evaluated the psychological and physiological effects on four test subjects. The team that participated in the first mission was made up of two males and two females: Victor Hurst IV, Ph.D.; Natacha Chough, MD; Jessica Vos; and Jared Daum.

Hurst wrote of the project before entering the habitat on his Facebook account, giving a good synopsis.

"Four-person crew on a simulated space exploration mission in a habitat called the Human Exploration Research Analog (HERA)," Hurst noted. "Starting Feb. 26, the four crew members (two females, two males) will be in the HERA for seven straight days to simulate the flight operations and isolation associated with a space mission to a very far-away asteroid (i.e., close proximity to Mars).



The team prepares for their mission on the second floor of the HERA, showing the tight, cramped quarters.



The crew with their mission control team.

Each day was carefully planned out, with simulated research objectives and even public affairs and education activities, just as it would be on a real exploration mission. The schedule was similar to that of a typical day for an International Space Station crew member, including maintenance, science, mission simulation, exercise, meals and hygiene. The crew exercised a certain amount of time per day and ate the same freeze-dried space food that the crew eats aboard station.

But it wasn't all smooth sailing, as the mission control team introduced several stress factors to study the crew's reactions. These were unanticipated emergencies; for example, two days with a communications delay. Scientists will study how well the crew reacted when subjected to regular tasks and additional stress using feedback received after mission members complete questionnaires and surveys.

The crew volunteered to be a part of this unique project; however, there were a few prerequisites. The program looks for people who are driven and have the same qualities as an astronaut. They must train for one week and be ready to live in isolation and confinement for their "mission."

During the course of the simulation, the HRP ran 10 studies in parallel. One of the studies observed team coalition and collaboration to establish predictors of good team coalition. The crew had badges in their suits or clothing that recorded the proximity of other crew members. Another purpose was to test the software being used for this type of tracking.

Along with the badges, the test also tracked crew interaction with ground



The team is excited to exit the HERA after seven days inside.

control through oral (the loops) and text. Scientists will perform linguistics analyses on the results to extract parameters of stress by the language of the crew. The software objectively measures certain words that indicate happiness, fatigue, stress and more from recorded conversations.

As a habitability study, the project evaluated the frequency and value of using certain tools, including technology from Google Glass to iPads.

Four HERA missions are planned throughout this year, and that pace is anticipated to carry out through the next several years. In the future, the team will extend the undertakings and simulate 30-day missions. For those, the crew will be tested more intensely in validating tools and exploring the physiological and psychological pressures of confinement.

As HRP continues to develop HERA to become more like a real mission into space, they will continue to invest in the infrastructure to make it more realistic. This includes the possibility of using the facility for actual crew training exercises and real hardware slated for spaceflight. Partnering with different organizations across the center will assist HRP in building up the HERA to meet multiple organizational objectives.

Being encapsulated with the same high achievers for seven, or even 30 days, would be an emotional exercise not many would relish; however, NASA wants to ensure that when future crews are scavenging an asteroid or otherworldly realm, they don't want to hitch the first ride back because of issues that could have been anticipated and corrected before the mission even began.



The test participants shortly after their simulated mission is complete.



The ground crew welcomes the test subjects back to normal life with high-fives all around.

Welcome home, Expedition 38

LANDING IN WEATHER that would make this year's unrelenting winter in the United States seem measly, Expedition 38 crew members returned to Earth after five-and-a-half months aboard the International Space Station.

Soyuz Commander Oleg Kotov and Expedition 38 Flight Engineers Mike Hopkins and Sergey Ryazanskiy left Expedition 39 Commander Koichi Wakata and Flight Engineers Rick Mastracchio and Mikhail Tyurin aboard the orbiting complex. Wakata, a Japanese astronaut, is the Japan Aerospace Exploration Agency's first station commander.



NASA/PHOTO NASABILL INGALLS

The three-member Expedition 38 crew rests outside after landing in the snowy steppe of Kazakhstan.

Kotov completed his third mission aboard the orbital laboratory for a total of 526 days in space. He served as a flight engineer during Expedition 15 in 2007. He then served for six months as an Expedition 22/23 crew member beginning in December 2009.

Hopkins and Ryazanskiy wrapped up their first space mission, each accumulating 166 days in space. During his stay aboard the orbital laboratory, Hopkins conducted a pair of U.S. spacewalks for a total 12 hours and 58 minutes. Ryazanskiy conducted three Russian spacewalks during his mission, working outside the station for 20 hours and five minutes.

Hopkins joined NASA astronaut Rick Mastracchio for the first pair of Expedition 38 spacewalks, installing a new ammonia pump module to restore the station's cooling system. The U.S. astronauts began the first spacewalk Dec. 21, exiting the Quest airlock to remove and stow a degraded pump module. They completed the installation of the new pump module during a second spacewalk on Dec. 24.

Shortly after those excursions, Ryazanskiy and Kotov exited the Pirs docking compartment Dec. 27 to install photographic gear, route cables, remove completed external experiments and install new scientific gear. The duo went out a second time Jan. 27 to complete the photographic installation work, retrieve more science gear and enable robotic arm operations on the station's Russian segment.

Kotov and Ryazanskiy's first spacewalk occurred Nov. 9, when the duo handed off the Olympic torch in its first ever "outer space portion" of the relay. The torch was returned to Earth the next day and used to light the Olympic flame Feb. 7 at the 2014 Winter Olympic Games in Sochi, Russia.

Nestled inside the returning Soyuz TMA-10M spacecraft was gear, personal items and plenty of science. Student investigations launched on Orbital Sciences Corporation's Orbital 1 mission in January also returned with the crew.

(continued from page 5)

This redundancy on both the parachutes and thrusters is designed to ensure safe landings for crews. The parachute test puts SpaceX closer to launch abort system tests in 2014.

Milestones achieved by CCP's partners continue to push commercial

spacecraft and transportation systems from design to reality. The successes of NASA and American aerospace companies are ushering in a new generation of space transportation capabilities, which will enable new opportunities for humans to live and work in space.



NASA/PHOTO KIM SHIFLETT KSC-2013-4505

The SpaceX Dragon test article splashes down following a test over the Pacific Ocean, off the coast of Morro Bay, Calif.



NASA/PHOTO KSC-2013-3230

The Sierra Nevada Corporation Dream Chaser flight vehicle is prepared for 60-mph tow tests on taxi and runways at NASA's Dryden Flight Research Center in California.

JSC, up close and personal—through the power of the lens



By Catherine Ragin Williams

FOR MOST OF US, living certain moments are impossible. For instance, will you get the opportunity to ride in the backseat of a T-38, chasing one of the space shuttle orbiters across the country as it embarks on a trip to its new home? Certainly not—unless you happen to be a Johnson Space Center photographer. And then, not only will the photographer live in the moment, but he will capture it for posterity.



NASA/PHOTO ISS031ET12281

Self-portrait of Expedition 31 Flight Engineer Don Pettit inside the International Space Station's cupola, showing the setup for nighttime photography. A makeshift turtleneck-like fabric sheet creates a stray light shield to keep Node 3 lights from causing internal reflections off the cupola windows while allowing Pettit to control the cameras. The window shutters were closed for this photo to prevent the intense sunlight from casting dark shadows.

Right now, JSC team members and astronauts are living history. Our photographers are allowing others to see it and vicariously experience this history as it unfolds.

"Here at JSC, we have some of the most talented photographers, graphic artists and lab technicians in the industry that masterfully tell the story of human spaceflight and the technology behind it," said Gordon Andrews, communications coordinator for DB Consulting, Inc., and mastermind behind the *NASA: Through Our Eyes* exhibit. "That story is not told nearly enough, and our photographers and graphic artists do not get the recognition they deserve for telling this story for generations to come."

On Jan. 16 at JSC's visitor center, Space Center Houston, a one-of-a-kind photography exhibit was unveiled, showcasing amazing imagery that has been taken of the programs, projects, technology and space ventures that JSC has orchestrated over the years. Entitled *NASA: Through Our Eyes*, the exhibit highlighted many of the behind-the-scenes moments that most outside of our center are never privy to and do not get to enjoy. Andrews knew it was something that needed to be rectified—but how?

"Actually, it was Gordon Andrews' brainchild to showcase all of the work," said JSC photographer Robert Markowitz with DB Consulting, Inc., who was also instrumental in pulling the exhibit together. "The word's kind of gotten out about all of these high-end production shoots. And (Andrews) has this huge conglomerate of images ... Rather than having it hidden in (Imagery Online) or on somebody's computer, he wanted to showcase them."

Given the rising popularity of social media and sites like Instagram, imagery is a vital component in showing, not just telling, NASA's benefits for humanity.

"Photographs, unlike any other medium, are able to tell a compelling story to the most people over the longest period of time," Andrews said. "And using creative photographic techniques allowed us to highlight the most pertinent details of a scene, creating a unique experience for the viewer."

A lot of time and effort goes into the stylized shoots, which are designed to literally—and figuratively—show JSC projects in the best possible light.

As Markowitz said, the challenge is "coming up with unique images in a mundane or ordinary government facility, and that's kind of what we tried to do with the behind-the-scenes shots. We're trying to go in and turn it into a beautiful showcase image that people can use in brochures and publications and annual reports. That's, I think, the neatest thing ... when they see the images and they're like, 'Wow, I didn't know my lab could look so neat.'"

But it's not just about snapping photos. An entire team supports the photography group, making every image released its own work of art.

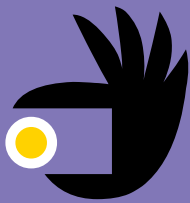
"It's really a team effort," Markowitz said. "We have people down the hall that on every single production image, spend countless hours retouching. Though we get it as close as we can, it still needs some



NASA/PHOTO JSC2011E037019

Lab Manager Kelly Flowers prepares food for the International Space Station crew at the Texas A&M Space Food Research Facility in College Station, Texas.

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Spotlight: Wendy Watkins

Project Coordinator/Education and Public Outreach Specialist for SAIC

Q: So what do you do?

A: Mostly I do education and public outreach for specific projects like Morpheus and analog missions like NEEMO [NASA Extreme Environment Mission Operations] and Desert RATS [Research and Technology Studies]. I tweet, therefore I am.

Q: Coolest part of your job at Johnson Space Center?

A: One cool part of my job is working with so many crazy-smart people and feeling like it sometimes rubs off on me ... and also feeling like I'm part of something huge and meaningful—something way bigger than me. But the absolute coolest and most favorite part of my job is when I see the looks on kids' faces when we do an outreach event and they are so excited to connect to people at NASA and learn about space. I love when I see the twinkle of inspiration in even just one eye! Two is better.

Q: March is National Women's History Month. What woman/women in history have been inspirational to you, and why?

A: In history, I'd definitely say Amelia Earhart because of all of her moxie, but a less-famous inspirational woman to me would be my stepmother, Joanie, who left us in September after a two-year battle with cancer. The fight she put up ... she fought it hard.

Q: What personal achievement are you most proud of?

A: My two monkeys. I mean, my children.

Q: What would people be surprised to know about you?

A: People would probably be surprised, or maybe not so surprised, to know that I used to compete on half pipes on Rollerblades, and I was sponsored by Rollerblade to do it. Don't be fooled, I wasn't that good—but it was fun.

Q: If you could trade places with any other person for a week, famous or not famous, living or dead, real or fictional, who would it be?

A: I can't imagine anyone in the world that I'd want to change places with. I'm happy in my shoes. Maybe just with someone who was getting ready to go on an amazing weeklong all-expenses paid vacation to somewhere tropical with nice places to hike and awesome waves for surfing.



NASA / PHOTO

Wendy Watkins out in the field with Desert RATS.

Q: What is your favorite indulgence?

A: Candy bar in a cup... a.k.a. caramel macchiato or some equally delicious sweet coffee treat.

Q: What subjects interested you while growing up and in school?

A: Always art.

Q: What seemingly "little things" bring you joy?

A: The giggles from my kids and the notes or surprises they leave in my bags when I have to go out of town.

Q: What is your favorite way to spend a Saturday?

A: I love a Saturday where I can wake up and go for a run and then do something outdoors and fun.

Q: Describe yourself in three words.

A: Wicked-smart, silly, energetic.

Q: What is the best piece of advice you've heard?

A: Never allow someone to be your priority while allowing yourself to be their option. Thanks, Dad (and Mark Twain).

Q: When did you first become interested in space, and why?

A: My Aunt Doe used to work in Building 1 back in the early '70s, and I came on-site for a visit. It was so beyond reality to me, futuristic and sci-fi. I was fascinated! I never imagined that I would work here.

Q: What is your favorite memory at JSC or of the space program?

A: My favorite memories are from personal experiences. My first shuttle launch, STS-129, which happened to be two days before my birthday, and every time I supported Desert RATS out in the field.

Q: What is NASA currently doing that has you most excited?

A: I'm most excited and hopeful that the project I'm currently supporting, Morpheus, continues in some way and ends up on the lunar surface.



NASA/PHOTO JSC2011E119201

In the Deep Space Habitat out at Desert RATS, Watkins briefs two astronauts and two geologists about upcoming outreach events scheduled for the mission.

NASA Administrator Charles F. Bolden Jr. to Receive the National Space Trophy

THE ROTARY NATIONAL AWARD

for Space Achievement (RNASA) Foundation has selected NASA Administrator Charles F. Bolden Jr., retired United States Marine Corps Major General and former astronaut, to receive the 2014 National Space Trophy on April 11 at the Houston Hyatt Regency.

Bolden was nominated by Col. Robert Cabana, director of the Kennedy Space Center and former astronaut, and by Robert Jacobs, NASA deputy associate administrator, Office of Communications.

Cabana nominated Bolden for his “many years of dedicated service and exceptional leadership through an extremely challenging transition in America’s space program, establishing NASA’s exploration architecture for the future and enabling successful commercial operations to low-Earth orbit.”

Jacobs nominated Bolden for his “dedication to public service, leadership and contributions to aeronautics and aerospace throughout a distinguished military and civilian career.”

“I am humbled by this selection and will be extremely honored to attend the RNASA Gala in April to accept this award on behalf of the entire NASA-contractor team I am privileged to lead,” Bolden said.



NASA Administrator Charles F. Bolden Jr. is a retired United States Marine Corps Major General and former astronaut.

NASA/PHOTO JSC2009E150609

During Bolden’s tenure, the agency’s science activities include an unprecedented landing on Mars with the Curiosity rover, launch of a spacecraft to Jupiter, enhancing the nation’s fleet of Earth-observing satellites and continued progress toward the 2018 launch of the James Webb Space Telescope, the successor to the Hubble Space Telescope.

A veteran of four spaceflights, he has logged more than 680 hours in space. Bolden served as pilot on STS-61-C and STS-31, and was the mission commander on STS-45 and STS-60.

Bolden’s 34-year career with the Marine Corps also included 14 years as a member of NASA’s Astronaut Office. Bolden’s military decorations include the Navy Astronaut Badge, Defense Distinguished Service Medal, Defense Superior Service Medal, Legion of Merit (one award star), Distinguished Flying Cross, Defense Meritorious Service Medal (one oak leaf cluster), Air Medal (one award star and Strike/Flight numeral 8), NASA Outstanding Leadership Medal, NASA Exceptional Service Medal (two award stars), NASA Space Flight Medal (three award stars), Navy Unit Commendation, National Defense Service Medal (one service star), Vietnam Service Medal (two service stars), Vietnam Gallantry Cross unit citation and the Vietnam Campaign Medal.

Fun fact:

On Aug. 28, 2012, Bolden was the first human to have his voice broadcast on the surface of Mars or any other planet. Although the Curiosity rover has no speakers, it received the transmission of his voice and then beamed it back to Earth.

We are sharing and caring on Instagram

Have you been enjoying the breathtaking imagery in this issue? See more, every day, by following JSC’s Instagram account! We have been sharing photos of center-related activities both on the ground and in orbit for the past few months and encourage all team members to check it out. If you

have ideas for projects, events, technology and more to feature on our Instagram feed, please contact Sarah Ruiz at sarah.g.ruiz@nasa.gov. Bookmark our Instagram page: <http://www.instagram.com/nasajohnson>



NASA/PHOTO

An image that has been posted to JSC’s Instagram also helps us celebrate National Women’s History Month in March. When NASA introduced its first class of astronaut candidates for the space shuttle era on January 31, 1978, the group included women for the first time. Pictured in this throwback image are, from left to right, Rhea Seddon, Anna L. Fisher, Judith A. Resnik, Shannon W. Lucid, Sally K. Ride and Kathryn D. Sullivan.

Roundup

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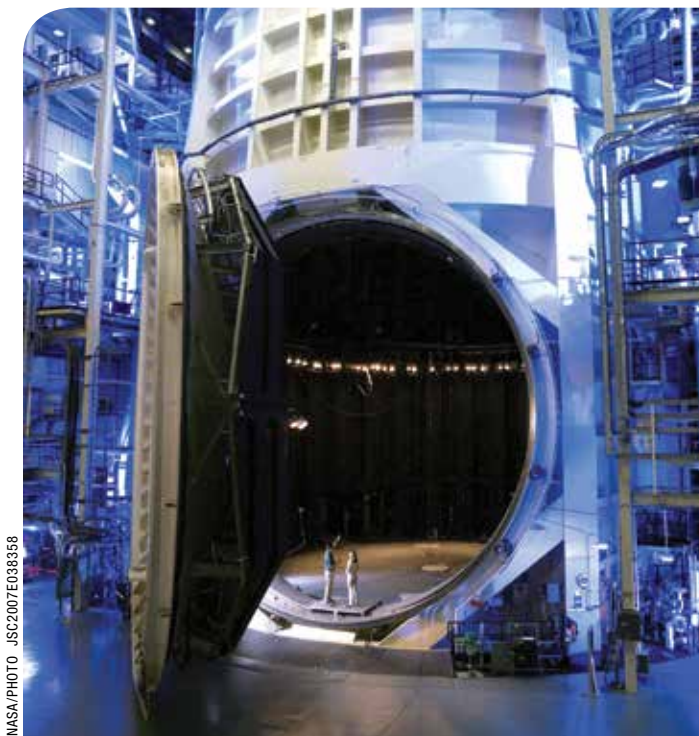
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JSC, up close and personal—through the power of the lens

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NASA/PHOTO JSC2007E038358

View of Thermal Vacuum Test Chamber A in the Space Environment Simulation Laboratory at JSC. Chamber A has been instrumental in testing space vehicles and components for all major programs since Apollo. It is currently being modified to support the James Webb Space Telescope.

retouching here and there. So they make our work look fantastic. And then you have the people in other part of the lab that make all the prints that the public gets to see and that get posted on the Web. Even with the astronaut photography, it's the same thing. It's the astronauts who get to go up there and take the images, but they have the trainers who are well schooled in photography, teaching them all the techniques."

While JSC Director Ellen Ochoa and many in senior management were there for the *NASA: Through Our Eyes* opening, the exhibit tiger team of Andrews, Markowitz and Vicky Cantrell are looking to



NASA/PHOTO JSC2012E216102

Space Shuttle *Endeavour* sits atop NASA's Shuttle Carrier Aircraft on Sept. 19, 2012, near the end of the first leg of a cross-country flight, and flies over JSC. *Endeavour* and the modified 747 jetliner were on their way to Los Angeles, where the orbiter was placed on public display at the California Science Center. This was the final ferry flight scheduled in the Space Shuttle Program era.



NASA/PHOTO JSC2013098279

Robonaut jumps for joy in a lab at JSC, demonstrating the center's technological prowess and capacity for innovation.

showcase the photos again, this time at JSC and in the spring timeframe. After all, these moments don't just belong to the public—they also belong to the people making them happen each and every day.

"This photo exhibit honors the NASA photographers who document the Earth history part of our space program," said NASA astronaut Don Pettit, who was most recently an Expedition 30/31 flight engineer. Pettit also offered opening remarks at the exhibit's private opening at Space Center Houston. "It illustrates the magnitude of the effort it takes to explore space."